

VII. *A Preliminary Revision of the Labiduridae, a family of the Dermaptera.* By MALCOLM BURR, D.Sc., F.L.S., F.E.S.

[Read February 2nd, 1910.]

PLATES XLVI, XLVII.

THE family *Labiduridae* was erected by me in a recent paper (1909³) as one of the five families into which I divide the order *Dermaptera*. It is well characterised by the peculiar form of the pygidium; this organ is represented by a flap of the dorsal sclerite of the last abdominal segment, which is bent downwards between the branches of the forceps, so as to present a more or less vertical surface. The passage from the dorsal surface to the posterior is marked by an angular fold which is usually sharp and distinct; only in the curious Chilian genus *Gonolabina*, Verhoeff, is the passage gradual and the line of division not marked.

We may add that the antennae have generally numerous segments; the first few after the basal one being as a rule short.

In the paper referred to above, the group is sub-divided into six sub-families; this I now propose to raise to nine. The *Echinomatinae* are separated from the *Pyagrinae*, the *Parisolabinae* from the *Brachylabinae*, and a new sub-family, the *Palicinae* has been since added, with a single species.

The arrangement of these sub-families is as follows:—

- | | |
|---|-------------------|
| 1. Corpus valde deplanatum | 1. PALICINAE. |
| 1.1. Corpus haud valde deplanatum. | |
| 2. Mesosternum valde angustatum | 2. ALLOSTETHINAE. |
| 2.2. Mesosternum haud angustatum. | |
| 3. Prosternum valde angustatum | 3. ESPHALMENINAE. |
| 3.3. Prosternum haud angustatum. | |
| 4. Metasternum postice sinuatum. | |
| 5. Prosternum antice rotundatum | 4. ECHINOMATINAE. |
| 5.5. Prosternum antice acuminatum | 5. PYAGRINAE. |

- 4.4. Metasternum postice truncatum, vel valde productum et convexum.
5. Mesosternum postice rotundatum 6. PSALINAE.
- 5.5. Mesosternum postice truncatum.
6. Antennae 25-35 segmentatae; elytra perfecte explicata. 7 LABIDURINAE.
- 6.6. Antennae ad 15 segmentatae; corpus apterum.
7. Segmentum ultimum dorsale truncatum . . 8. PARISOLABINAE.
- 7.7. Segmentum ultimum dorsale emarginatum ac bilobum . . 9. BRACHYLABINAE.

Sub-family 1.—*PALICINAE*.

I am inclined to think that it was this species that Dohrn described under the name *Platylabia major*. It is the creature which de Bormans took for *P. major*, as the specimens recorded by him from Burma under that name are *Palex sparattoides*, and nothing else.

It is odd, but not incredible, that he should have described it in 1900 as a new species, after he had already handled it under the other name. I have no doubt about the identity of de Bormans' Burmese specimens, since I possess some of the original ones.

If this is correct, *Palex sparattoides*, Borm., falls as a homonym of *Platylabia major*, Dohrn, and the sub-family must be named *Platylabiinae*, and a new generic name formed for the group represented by *Pl. thoracica*, as I know of no other species congeneric with *P. sparattoides*.

For the present, however, I am in a position neither to assert nor prove the identity, but I consider it exceedingly probable.

Sub-family 2.—*ALLOSTETHINAE*.

The sub-family contains the single genus *Allostethus*, Verh., characterised by the triangular prosternum and strongly narrowed metasternum. I consider *A. lombokianum*, Verh., a good species, as it appears to be restricted to Lombok and has a perfectly distinctive appearance. *A.*

setiger, Verh., and *A. maartensi*, Verh., I regard as mere varieties of *A. indicum*, Hag.

It is necessary to remove to this genus *Psalis guttata*, Borm., which is the same as *Forficula doriae*, Dubr., so the correct name is now *Allostethus doriae*, Dubr.

Anisolabis piligera, Borm., has been looked upon as an aberrant form of the genus *Anisolabis*, but the pro- and mesosternum are strongly narrowed, so it must be removed to the *Allostethinae*. It may be the nymph of *A. indicum*, but as the three syntypes in my possession appear to be adult, we may provisionally call it *Allostethus piligerum*, Borm.; if it really is mature a new genus must be formed for its reception, since it is completely apterous.

Sub-family 3.—*ESPHALMENINAE*.

This group was recently revised by me (1901¹), and I have nothing to add, except that *Gonolabis inca*, Burr, from Peru, should be included here; it is a true *Esphalmenus*.

Sub-family 4.—*ECHINOSOMATINAE*.

This group I have recently separated from the *Pyragrinae*, in which Verhoeff included them, on the strength of the form of the prosternum; in the former group this plate has the anterior margin rounded; in the latter it is more or less bluntly pointed. The *Echinosomatinae* is formed only for *Echinosoma*, Serv., which is essentially an Old World group; the forceps of the male are invariably remote, cylindrical and arcuate, and the whole body is covered with stiff hairs and numerous, blunt, dilated bristles. All the species have a strong family likeness, and doubtless several may be advantageously reduced to the rank of local races or varieties.

A number of the existing species can only be discriminated by coloration, as a glance at the synoptical table of de Bormans will show. Unfortunately, sufficient material is not yet available to establish a satisfactory arrangement.

The following notes, however, may be of use for the identification of species, and may contribute to the establishment of a rational arrangement based on structural characters.

One species has the segments of the antennae clavate;

this is *E. parvulum*, Dohrn, the smallest known species, apparently confined to Ceylon. Brachypterous and macropterous forms occur. In all other species known to me the antennal segments are quite cylindrical.

Two species have the sides of the 7th-9th abdominal segments in the male acute and carinulate; these are *E. forbesi*, Kirby, from Dinner Island, and *E. distanti*, Burr, from the Transvaal. In all other species known to me the sides of these segments are rounded or convex, but not acute nor carinulate.

Three species, all Ethiopian, have the penultimate ventral segment of the male entire, that is, neither sinuate nor emarginate. *E. wahlbergi*, Dohrn, occurs in the African Continent; the female has a transverse pygidium, and the pronotum and wings are spotted.

The other two, with the pygidium of the female narrow, are *E. skalavum*, Borm., a small variegated species, and *E. bolivari*, Rodz, a large black species with uniform tawny wings. Both are confined to Madagascar and the adjacent islands.

The remaining species known to me all have the penultimate ventral segment of the male sinuate or emarginate.

The pygidium of the female is transverse and the abdomen of the male almost parallel in *E. afrum*, Beauv., and *E. horridum*, Dohrn. The former Ethiopian, the latter a Javanese species. In the former the penultimate ventral segment of the male is gently sinuate, in the latter decidedly emarginate.

The abundant Oriental *E. sumatranum*, Haan, with which I sink *E. westermanni*, Dohrn, as a mere colour-variant, has a narrow pygidium in the female and the abdomen of the male is moderately dilated about the middle: but the pygidium is truncate at the apex. It is either acute or blunt at the apex in *E. fuscum*, Bor., and *E. insulanum*, Karsch, neither of which are known to me. I have not yet been able to examine in both sexes authentic specimens of *E. occidentale*, Borm., from West Africa; *E. congolense*, Bor., from the Congo; *E. yorkense*, Dohrn, from Cape York, and *E. concolor*, Bor., from West Africa. but I hope before long to be able to compare them with the other forms.

Sub-family 5.—PYRAGRINAE.

This sub-family requires a revision and I now offer the following observations. The group represents the passage from the *Pygidicraninae* to the *Labidurinae*; both de Bormans and Verhoeff have given too much weight to the superficial resemblance to the former family. But apart from the essentially Labidurine form of the pygidium, the smooth and rounded femora, the sternal plates, and the elytra, are quite distinctive.

The anal or axillary angle of the elytra is weak, and consequently a small scutellum is sometimes exposed, but this apparently Pygidicranine feature is inconstant. De Bormans examined 150 specimens of *Pyragra fuscata*, and found this minute scutellum visible in about half of them.

The elytra are not keeled in any known species; the body is usually strongly pubescent, but never has the dilated bristles which characterise the *Echinosomatinae*; the lobe of the metasternum has a sinuous posterior margin as in that group, and as in the *Pygidicraninae*, but the anterior margin of the prosternum is always more or less pointed.

I include here four genera, all exclusively Neotropical, of which one is new.

TABLE OF GENERA.

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|--|----------------------------------|
| 1. Pronotum sublongius quam latius, antice angustatum. (Segmentum penultimum ventrale ♂ emarginatum; tarsi longi.) | 1. <i>Pyragra</i> , Serv. |
| 1.1. Pronotum transversum, margine antico recto. | |
| 2. Segmentum penultimum ventrale ♂ emarginatum. | 2. <i>Propyragra</i> , n. |
| 2.2. Segmentum penultimum ventrale ♂ integrum. | |
| 3. Caput depressum; tarsi breves | 3. <i>Pyragropsis</i> , Borelli. |
| 3.3. Caput tumidum; tarsi longi | 4. <i>Echinopsalis</i> , Borm. |

To supplement this table we may add that the head is depressed and the femora rather heavily thickened in all the genera, except *Echinopsalis*; while the tarsi are long in all, except *Pyragropsis*.

Genus 1.—PYRAGRA, Serv.

The genus *Pyragra*, as thus restricted, contains three species, as follows:—

1. Elytra unicoloria, fusca.
2. Statura minore (18 mm.); forceps
 - ♂ asymmetricus 1. *minor*, Borelli.
- 2.2. Statura majore (23 mm.); forceps
 - ♂ symmetricus 2. *fuscata*, Serv.
- 1.1. Elytra fulvo-vittata 3. *dohrni*, Scudd.

All authors are agreed in sinking *Thermastris*, Scudd., its type, *Th. brasiliensis*, Gray, being in my opinion, synonymous with *Pyragra fuscata*, Serv., the type of *Pyragra*; I also agree with Rehn that Serville's description and figure of *P. fuscata* is perfectly clear, so that it is unnecessary to employ any other name; *P. chontalia*, Scudd., and *P. saussurei*, Dohrn, are only based on wing-coloration, and so I sink them as mere trifling variations of a common and widely distributed species.

I think it probable that the creature described by Rehn (1903², p. 300), under the name of *Echinopsalis brevibractea*, is an immature specimen of the same species.

It extends from Mexico to Paraguay and appears to be common. *Pyragra minor*, Borelli, is a small species allied to *P. fuscata*, occurring in Costa Rica.

Genus 2.—PROPYRAGRA, n. g.

Differs from *Pyragra* in the almost rectangular transverse pronotum, which is not narrowed anteriorly. In the ♂, the sides of the 6th and sometimes of the 7th, 8th, and 9th, abdominal segments are sharply pointed posteriorly, the line joining the points being carried along as a more or less distinct keel on the sides of the last dorsal segment, corresponding with the outside ridge of the forceps. In other respects it resembles *Pyragra*; the penultimate ventral segment of the male is ample, broad, the angles broadly rounded, and the posterior margin gently emarginate in the middle. The species are generally smaller than those of *Pyragra*.

The type of the genus is *Pyragra paraguayensis*, Borelli.

The apparently trivial feature of the coloration of the pronotum appears to be a constant feature. *P. paraguayensis* seems to be a southern form. *P. brunnea* is only known from Peru. *P. buscki* is known from Jamaica and

Cuba; the type is preserved in the collection of the United States National Museum.

TABLE OF SPECIES.

- 1. Valde pubescens; segmentum ultimum dorsale ♂ supra utrinque carina acuta instructum.
- 2. Pronotum antice fuscum, postico fulvo maculatum ac lineolatum . . . 1. *paraguayensis*, Bor.
- 2.2. Pronotum fuscum, utrinque maculata singula fulva ornatum . . . 2. *brunnea*, Burr.
- 1.1. Corpus fere glabrum; segmentum ultimum dorsale ♂ carinula superiori nulla 3. *buscki*, Caudell.

Genus 3.—PYRAGROPSIS, Bor.

This is a monotypic genus founded by Borelli for *P. tristani*, from Costa Rica. It is a handsome species, of a strikingly contrasted black and yellow coloration.

Genus 4.—ECHINOPSALIS, Borm.

This genus still contains only *E. guttata*, Borm., as *E. brevibractea*, Rehn, I consider to be a larva of *Pyrogra fuscata* (q. v., ante, p. 166).

I have in my collection a single female from Peru, which may be referable to this genus; the head is depressed and brick-red in colour, the pronotum, tawny, with black band, as also the elytra and wings; the tarsi are long.

Possibly *Psalis thoracica*, Serv., is referable here; it is certainly a Pyragrid. The specimen figured by de Borman (1893, p. 4, Pl. I, fig. 7) is a female; it is very small, being only 6.5 mm. long.

Sub-family 6.—PSALINAE.

This sub-family includes those genera in which the metasternum is truncate posteriorly, but the mesosternum rounded, except in the monotypic genus *Titanolabis*, in which the metasternum is produced into a lobe, rounded at the extremity. All the genera include rather stoutly built species; the forceps are strong and trigonal, never very long, nor slender, often subcontiguous in the male,

and frequently asymmetrical, rarely toothed; many of the genera are apterous.

TABLE OF GENERA.

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|--|-------------------------------|
| 1. Metasternum postice in lobum angustum, apice rotundatum, productum; (corpus apterum; abdomen subparallelum) | 1. <i>Titanolabis</i> , n. g. |
| 1.1. Metasternum postice truncatum. | |
| 2. Abdomen ♂ a basi ad apicem ampliatum; (forcepsis brachia ♂ basi remota; corpus apterum) | 2. <i>Gonolabis</i> , Burr. |
| 2.2. Abdomen pone medium plus minus dilatatum, apice subangustius. | |
| 3. Elytra omnino desunt | 3. <i>Anisolabis</i> , Fieb. |
| 3.3. Elytra rudimentaria, vel perfecta. | |
| 4. Elytra rudimentaria; alae nullae | 4. <i>Euborellia</i> , Burr.* |
| 4.4. Elytra libera, perfecta; alae saepius adsunt. | |
| 5. Antennae segmentis 17-22 | 5. <i>Psalis</i> , Serv. |
| 5.5. Antennae segmentis 20-30 | 6. <i>Labidurodes</i> , Borm. |

Genus 1.—*Titanolabis*, n. g.

Cum genere *Anisolabide* congruet; ab eo differt pedibus brevibus, crassis, metasterno margine postico in lobulo apice rotundatum producto.

Type of the genus.—*Anisolabis colossea*, Dohrn.

The powerful build and the great size attained of this giant among earwigs have always led me to consider it as forming a distinct group; an examination of the sternal plates shows that the posterior margin of the metasternum is produced with a long, parallel-sided, apically rounded lobe, which is quite distinctive.

I have never examined one of the Burmese specimens reported by de Bormans, but I doubt if they are referable to the true *A. colossea*.

The range of size of this creature is very remarkable. I have in my own collection a female whose length, including the forceps, which are always short, is 22.5 mm., and another, which attains 51 mm., both from New South

* *Borellia* being praeoccupied by Rehn (1906, Proc. U.S. N. M., xxx, p. 379), I have proposed the new name *Euborellia*, Burr. See Proc. U.S. Nat. Mus., xxxviii, p. 448 (1910.)

Wales. Perhaps we may later be able to discriminate two species.

Genus 2.—GONOLABIS, Burr.

The genus *Gonolabis* has been subject to two distinct sources of confusion.

First Verhoeff's characterisation of his sub-family *Gonolabidae*, with *G. lativentris* as type, excluding by this very characterisation *G. javana*, which had been originally chosen as type.

Secondly the doubt as to the identity of the true *G. javana*, under which name no less than three species have been confused in collections.

The first confusion has been cleared up by the separation of Verhoeff's "*Gonolabidae*" into a separate sub-family, the *Esphalmeninae*. (See Burr, 1909¹.)

The second confusion is now cleared up, thanks to the courtesy of Dr. Gestro of Genova and Dr. Holdhaus of Vienna, who have kindly communicated the respective types of *G. sumatrana*, Borm., and *G. javana*, Borm.

Thus I have been able to examine authentic specimens of every known species of the genus, the catalogue of which now stands as follows:—

1. *G. kirbyi*, Burr, Java. Type examined.
2. *G. electa*, sp. n., Java-Ceylon. Type examined.
3. *G. sumatrana*, Borm., Java and Sumatra. Type examined.
4. *G. oblita*, sp. n., Java. Type examined.
5. *G. javana*, Borm., Java. Type examined.
6. *G. michaelseni*, Burr, Australia. Type examined.
7. *G. picea*, Borelli, E. Africa. Syntype examined.
8. *G. woodwardi*, Burr, Australia. Type examined.
9. *G. verhoeffi*, Burr, Australia. Type examined.

From this list will be observed that I have been able to examine and compare the types of every known species, except *G. picea*, and of that authentic syntypes kindly given me by Dr. Borelli, which is almost the same thing.

It will also be noticed from the above list that the genus is chiefly characteristic of the Oriental and Australian regions, a single species occurring in the Ethiopian region.*

* Since writing the above I have seen the type of *Anisolabis azteca*, Dohrn, from Mexico: it is a female, but evidently a *Gonolabis*. It will be discussed in a later paper.

It will be observed that the Neotropical *G. inea*, Burr, is omitted. This species is a true *Esphalmenus*, and should have been included in the revision of that group. (Burr, 1909¹.)

The genus *Gonolabis* is akin to *Anisolabis*, differing in the apically dilated abdomen of the male, and fewer antennal segments.

TABLE OF SPECIES.

1. Segmentum penultimum ventrale ♂
late rotundatum (neon apice ipso
subrecto).
2. Segmentum penultimum ventrale ♂
medio depressum, utrinque carina-
tum; forceps asymmetricus; (species
javana) 1. *kirbyi*, Burr.
- 2.2. Segmentum penultimum ventrale
♂ ♀ planum, haud carinatum;
forceps symmetricus.
3. Abdomen segmentis 7-9 ♂ lateribus
acutis; (statura minore; abdomen
♂ valde dilatatum) 2. *electa*, Burr.
- 3.3. Abdomen segmentis 7-9 lateribus
rotundato-convexis.
4. Segmentum ultimum dorsale ♂
margine postico truncato, rectis-
simo; (colore rufo, pedibus uni-
coloribus) 3. *sumatrana*, Borm.
- 4.4. Segmentum ultimum dorsale ♂
margine postico subsinuato;
(colore atro, pedibus annulatis). 4. *oblita*, sp. n.
- 1.1. Segmentum penultimum ventrale ♂ ♀
angustum, lateribus obliquis, apice
subtruncato, fere triangulare.
2. Segmentum penultimum ventrale ♂
medio carinato; (species javana) . . 5. *javana*, Borm.
- 2.2. Segmentum penultimum ventrale ♂
laeve.
3. Segmentum ultimum dorsale ♂
utrinque plica cristata instruc-
tum; (statura majore; species
westralica) 6. *michaelseni*, Burr.

- 3.3. Segmentum ultimum dorsale ♂
 plica cristata nulla.
4. Forcipis bracchia ♂ nec dentata
 nec denticulata; (colore ater-
 rimo; species africana). . . . 7. *picea*, Borelli.
- 4.4. Forcipis bracchia ♂ ornata;
 (species australicae).
5. Forcipis bracchia ♂ prope basin
 superne crenulata 8. *woodwardi*, Burr.
- 5.5. Forcipis bracchia ♂ prope basin
 superne dente forti armata . . 9. *verhoeffi*, Burr.

1. *Gonolabis kirbyi*, Burr.

Anisolabis? *kirbyi*, Burr (1897⁴), p. 311.

This Javan species is well characterised by the form of the penultimate ventral segment of the male, which is broad and rounded but depressed in the middle, with a well-marked ridge on each side.

The abdomen is also more strongly and more abruptly dilated towards the apex than in most other species, thus resembling *G. electa*, and the forceps are asymmetrical, the right branch being bowed inside the left.

It is so far only known from the unique male in my collection, taken by Frühstorfer at Pengalengan, in Western Java, at an elevation of 4000 feet.

2. *Gonolabis electa*, Burr.

Gonolabis electa, Burr (1910¹), p. 79, fig. 21.

Gonolabis javana, A., Burr (1908¹¹), p. 78.

This species is probably represented in many collections under the name of *G. javana*, together with *G. oblita*. Several years ago Dr. Borelli called my attention to the fact that apparently two species were confused in collections under this name, and inquired my opinion. It was not, however, until the opportunity of examining de Bormans' type of *G. javana* presented itself, that it became obvious that *neither* of these two was the real *G. javana*, and consequently new names became necessary for them both.

G. electa, which occurs in Ceylon and in Java (c.m.) is one of the smallest of the genus, and has the most strongly dilated abdomen, in correlation with which we find the

sides of the 7th-9th abdominal segments strongly acute in the male. The female may be recognised by her small size, deep colour, and broad abdomen.

3. *Gonolabis sumatrana*, Borm.

Gonolabis sumatrana, Borm. (1900¹), p. 452.

This species is discriminated by de Bormans from *G. javana* only by the coloration. From the true *G. javana* it differs in the form of the penultimate ventral segment of the male, but it is probable that in the synoptical table given by de Bormans (1900¹), p. 451, he includes in *G. javana* the common species which we discriminate under the name *G. oblita*.

A comparison of the type of *G. sumatrana* with a good series of *G. oblita* shows that though quite different in appearance, there are few structural characters to separate them.

G. sumatrana is somewhat larger and of stouter build, of a uniform reddish brown, with plain feet and antennae; the punctulation of the abdomen is finer, and the pubescence is very dense in the type, but is apparently worn off in a second specimen from Java, in the Leyden Museum.

4. *Gonolabis oblita*, sp. n.

Gonolabis javana, Burr (1902), p. 479.

Gonolabis javana, B., Burr (1908¹¹), p. 78.

Statura parva; colore nigro-castaneo; antennae pedesque annulati; abdomen vix dilatatum; segmentum penultimum ventrale ♂ late rotundatum; segmentum ultimum dorsale laeve, margine postico subconcaavo; forcipis brachia ♂ typica, arcuata.

	♂	♀
Long. corporis . . .	9-10 mm.	9.5-12 mm.
Long. forcipis . . .	1.5-2 „	1-2 „

Of medium size and rather slender build; colour deep shining reddish black.

Antennae black, ringed with white before the apex; with 13-14 segments.

Head smooth, tumid; sutures obsolete.

Pronotum subquadrate, slightly longer than broad, and slightly

widened posteriorly, sides straight; prozona somewhat tumid, separated by a transverse depression from the metazona.

Meso- and metanota typical.

Sternal plates typical, pale yellow.

Legs yellow, femora broadly banded with black; tarsi very slender.

Abdomen punctulate, gradually and gently widened towards the apex; sides of 7th, 8th, and 9th segments in ♂ convex but not acute. Last dorsal segment ♂ quite smooth, shining, transverse, with a sharp low keel on each side in correspondence with the outer edge of the forceps, and a slight protuberance on each side of the hinder margin, in correspondence with the upper edges of the forceps; between these two points, the hinder margin is subconical; in female similar, but decidedly narrowed apically and simple.

Penultimate ventral segment ♂ broadly rounded, in ♀ rather obtusely triangular.

Pygidium narrow, compressed.

Forceps with the branches ♂ remote, stout, trigonal, unarmed, straight at first and tapering; apical third smooth and arcuate; in ♀ nearly straight, contiguous, stout, trigonal, and tapering.

JAVA (c.m.), Buitenzorg (c.m.), Malang (c.m.), Ambarawa (c.m.).

This species has invariably been considered to be de Bormans' *G. javana*, but the penultimate ventral segment of that species is absolutely distinctive. Under the common name of *G. javana* it has been confused with *G. electa*, but the gradually and gently dilated abdomen and longer body give it a totally distinct appearance.

It is structurally nearest to *G. sumatrana*; the deep red-black colour, black-banded femora, and pale ringed antennae give it a different appearance; it is smaller in size and slenderer in build; the sculpture of the abdomen is coarser; the abdomen also is less pubescent; the forceps in *G. oblita* are arcuate, that is, bent inward at a curve, whereas in *G. sumatrana*, they are more usually bowed, that is, bent at an angle.

This species has a strong superficial resemblance to *G. woodwardi*, but differs in the totally unarmed forceps, apart from the different penultimate ventral segment of the male.

It appears to be common in Java.

De Bormans himself confused it with *G. javana*, as I possess a female which came from that collection under that name.

5. *Gonolabis javana*, Borm.

Anisolabis javana, Borm. (1883), p. 63, Pl. II, fig. 4, (1900²), p. 27.

Anisolabis javana, Borm. (1900¹), p. 451 partim.

Gonolabis javana, Burr (1900³), p. 49 (nec 1902, p. 479).

Most collections have specimens under the name of *G. javana*, as we have seen under *G. electa* and *G. oblita*, but it is probable that no authentic specimen exists beyond the type in the Brunner collection, now in the Vienna Museum.

In size and general appearance it closely resembles *G. sumatrana*.

The head and pronotum are brick red, with black markings, the general colour is a dull blackish red.

Absolutely distinctive in the form of the penultimate ventral segment, which is figured by de Bormans; it is in the form of a blunt pointed obtuse triangle, with a prominent central compressed crest or ridge.

The type is from Java, and is numbered 14, 6996.

6. *Gonolabis michaelsoni*, Burr.

Gonolabis michaelsoni, Burr (1908¹¹), p. 73, Pl. I, fig. 4.

„ „ do. *var. dentata*, op. cit. p. 75, Pl. I, fig. 5.

This striking species, the giant of the genus, is described, figured and discussed in detail in the work quoted.

7. *Gonolabis picca*, Borelli.

Gonolabis picca, Borelli (1907³).

This, the only known Ethiopian species, was discovered by H.R.H. the Duke of the Abruzzi at Butiti, in Eastern Africa.

It is remarkable for its intense pitch black colour.

8. *Gonolabis woodwardi*, Burr.

Gonolabis woodwardi, Burr (1908¹¹), p. 75, Pl. I, fig. 1.

„ „ *var. dentata*, op. cit., Pl. I, fig. 2.

This species, which is abundant in Western Australia, is discussed, figured, and described in the work quoted.

9. *Gonolabis verhoeffi*,* Burr.

Gonolabis verhoeffi, Burr (1905³), p. 487.

This species is well marked by the prominent teeth on the upper surface of the forceps of the male, near the base.

In addition to the two males in the Hope Museum, Oxford, I have received a third from Kuranda, Queensland, sent me by Mr. Simmonds.

Genus 3.—ANISOLABIS, Fieber.

This genus contains about forty species, even after the separation of those furnished with rudimentary elytra into the genus *Euborellia*. It requires a thorough revision, as a good many names will require to be sunk in synonymy, and perhaps one or more new genera may be necessary. For instance, the gigantic *Anisolabis colossea*, Dohrn, from New South Wales, may be conveniently separated owing to its produced and apically rounded metasternal lobe. I will not, however, offer a revision yet, as the material is not complete.

Immature specimens of *Psalis* are frequently mistaken for some of the less well-marked species of *Anisolabis*. Some of the smaller kinds seem to pass insensibly from one form to another, with subtle distinctions that are difficult to express. My personal inclination is to sink all species which are not clearly defined upon some well-marked structural character, though it is not always easy to say which forms should be fused. In this respect, as in the analogous case of *Labidura riparia*, I assume the attitude of a frank "lumper." †

The genus *Anisolabis* has become less unwieldy now

* Since writing the above, I have identified this species with *Anisolabis brunneri*, Dohrn, of which I have seen the type. *A. brunneri* of Burr is a totally different creature.

† Since going to the press, further material has been examined, which will be dealt with in a later paper. But it may be mentioned here, with reference to the above table, that *A. incerta*, Borm., appears to be a melanic form of *A. festae*, Borelli; that *A. eteronoma*, Borelli, is in my opinion indistinguishable from *A. annulipes*, Luc., as also *A. aporonoma*, Borelli.

The species referred to by me as *A. brunneri*, Dohrn, and recorded and figured by me in (1908¹¹), p. 71, Pl. I, fig. 6, is not the true *A. brunneri* of Dohrn, which is the same as *Gonolabis verhoeffi*, Burr; the *A. brunneri* figured by me is a well-known species which requires a new name, unless it can be identified with *A. pacifica*, Erichson.

that nine species with rudimentary elytra have been removed to form the genus *Euborellia*, and *A. colossa* separated in a new genus *Titanolabis*.

The number is further reduced by the removal of *A. pili-gera* to the *Allotethinae*, and by the sinking of a number of names, such as *A. bormansi*, Scudd., *A. antoni*, Dohrn, and other well-known synonyms, under *A. annulipes*.

There still remain a good many whose exact position is still doubtful; such are *A. aporonoma*, Bor., *A. gaudens*, Burr, *A. spectabilis*, Phil., *A. pacifica*, Erichs., *A. angulifera*, Dohrn, *A. pectoralis*, Etsch., *A. annulicornis*, Blanch.

I am not yet certain which of two kindred forms is the true *A. marginalis* of Dohrn.

A. albovittata, Burr, is probably immature. *A. advena*, Mein., *A. subarmata*, Kirby, and *A. antenna*, Kirby, are unrecognisable; as also *A. peregrina*, Mjöberg, *A. pluto*, Rehn, which is the female of *A. angulifera*, Dohrn. *A. major*, Brullé, is probably the larva of *A. maxima*, Brullé.

The following table is not intended for a scientific discrimination of species, but purely as a provisional arrangement, as help-notes for identification.

TABLE OF SPECIES.

- | | |
|--|-----------------------------|
| 1. Oculi desunt | 1. <i>caeca</i> , Bor. |
| 1.1. Oculi adsunt. | |
| 2. Abdomen ♂ segmentis 6-9 lateribus rotundatis, vel convexis, neque acuminatis, neque carinulatis, nec striolatis. | |
| 3. Statura gracili; forcipis brachiiis ♂ elongatis, attenuatis; antennarum segmentis 4 et 5 cylindricis. | |
| 4. Statura minore; species hawaiiensis | 2. <i>perkinsi</i> , sp. n. |
| 4.4. Statura majore; species africana | 3. <i>rosseleri</i> , Burr. |
| 3.3. Statura robustiori; forcipis brachiiis curvatis vel subrectis, haud elongatis; antennarum segmentis 4 et 5 fere globularibus. | |
| 4. Forcipis brachia ♂ margine interno excavata | 4. <i>xenia</i> , Kirby. |
| 4.4. Forcipis brachia ♂ margine interno haud excavato. | |

- 5. *Forcispis bracchia* ♂ *dentata*.
 - 6. Colore fusco-castaneo ; capite rufescenti ; species australica 5. *occidentalis*, Kirby.
 - 6.6. Colore piceo ; species equatoria 6. *incerta*, Borm.
- 5.5. *Forcispis bracchia* ♂ *inermia*.
 - 6. Femora fusco-annulata ; species japonica 7. *marginalis*, Dohrn.
 - 6.6. Femora fulva ; species hawaiiensis 8. *eteronoma*, Bor.
- 2.2. Abdomen ♂ segmentis 6-9 lateribus acutis vel valde convexis.
- 3. Abdomen ♂ segmentis 6-9 lateribus striolatis et carinulatis.
- 4. *Forcispis bracchia* ♂ basi remota, valde arcuata.
- 5. *Forcispis bracchia* ♂ intus dentata.
 - 6. Corpus atrum ; species australica 9. *brunneri*, Dohrn.
 - 6.6. Corpus pallescens ; species equatoria 10. *festae*, Bor.
- 5.5. *Forceps* ♂ *inermis*.
 - 6. Statura minore ; femora maculata ; species africana orientalis 11. *teilinii*, Bor.
 - 6.6. Statura majore ; femora fulva ; species algerica . 12. *mauritanica*, Luc.
- 4.4. *Forcispis bracchia* ♂ basi subcontigua, paullo arcuata.
- 5. Segmentum ultimum dorsale ♂ lateribus externis haud carinatis ; caput rufum ; pedes unicoloribus ; species africana orientalis 13. *laeta*, Gerst.
- 5.5. Segmentum ultimum dorsale ♂ margine externo carinulato.
 - 6. Caput pallidum ; pedes unicolores ; species africana orientalis 14. *compressa*, Bor.
 - 6.6. Caput nigrum ; pedes annulati ; species cosmopolitana 15. *annulipes*, Luc.

- 3.3. Abdomen ♂ segmentis 6-9 lateribus punctatis vel striolatis, haud carinulatis.
4. Segmentum ultimum dorsale ♂ utrinque tuberculatum.
5. Forceps ♂ valde arcuatus; species ceylonica 16. *kudagae*, Burr.
- 5.5. Forceps ♂ elongatus, apice tantum arcuatus; species canariensis 17. *maxima*, Brullé.
- 4.4. Segmentum ultimum dorsale ♂ inerme.
5. Forcipis brachia ♂ basi remota, fortius arcuata, symmetrica.
6. Forcipis brachio dextro ♂ dente rectangulari armato.
7. Caput nigrum; species cosmopolitana 18. *maritima*, Bon.
- 7.7. Caput rufum; species africæ orientalis . . . 19. *felix*, Burr.
- 6.6. Forceps inermis; species australica 20. *littorea*, White.
- 5.5. Forcipis brachia ♂ basi subcontigua, vix arcuata.
6. Forcipis brachia ♂ intus crenulata; caput rufum; species birmanica . . . 21. *dubronii*, Kirby.
- 6.6. Forcipis brachia ♂ haud crenulata; caput nigrum; species africana 22. *infelix*, Burr.

Anisolabis perkinsi, sp. n.

Statura mediocri, gracili; colore fusco-castaneo et nigro; antennae segmentis 4 et 5 haud globularibus; abdomen gracile, vix dilatatum, segmentis lateribus laevibus, haud acutis; pedes longi, graciles; forcipis brachia ♂ ♀ subcontigua, triquetra, subarcuata, attenuata, inermia.

	♂	♀
Long. corporis	13 mm.	15 mm.
; forcipis	3 „	3.5 „

Of medium size; build slender; general colour dark chestnut brown to black.

Antennae with 16 segments, dark brown; first long and slender, apically clubbed; third long and slender, cylindrical; 4th and 5th cylindrical, each about half as long as the 3rd, the rest gradually lengthening, all slender and cylindrical, the apical segments about as long as the third.

Head dark brown, smooth and shining; eyes small.

Pronotum slightly longer than broad; gently widened posteriorly, all margins straight, sides gently reflexed.

Meso- and metanota transverse, typical: all the thorax dull deep brown, with a few brown bristles; smooth.

Sternal plates lighter brown; prosternum almost parallel sided; mesosternum rounded; metasternum truncate posteriorly.

Legs long and slender, dull brown; tarsi very slender.

Abdomen slender, feebly dilated beyond the middle and apically attenuate in both sexes, exceedingly finely punctulate; sides of segments 6-9 in ♂ rounded and smooth.

Last dorsal segment ♂ ♀ slightly narrowed apically, with a median sulcus, posterior margin subsinuate, with a slight convexity corresponding to the upper ridge of the forceps.

In forceps with the branches ♂ ♀ subcontiguous at the base, trigonal, rapidly attenuate, feebly arcuate, more so in the ♂ than in the ♀, slender; black, with a fulvous spot on the outer face near the base.

SANDWICH ISLANDS: *Kauai*, Koholuamano, 4000 ft., and Waimea, iv/95 and vii/96 (Perkins).

This is evidently the species quoted by Brunner (P.Z.S., 1895, p. 892) and by Perkins (Fauna Haw., 1899, p. 4) as *A. pacifica*, Erichs., but it is not "half the size of *F. auricularia*," nor do the forceps correspond to Erichson's description.

There are specimens in the British Museum, and a pair in my collection, the male of which is my type.

The two sexes are very much alike; the slender body and limbs distinguish it, as much as the relatively long fourth and fifth segments of the antennae.

According to Perkins, it is found only in the mountains of *Kauai*.

Genus 4.—EUBORELLIA, Burr.

This genus was erected recently, under the name *Borellia*, by me (1909³, p. 325) for those species, formerly included in *Anisolabis*, with distinct rudimentary elytra, named in honour of my good friend Dr. Alfredo Borelli, of

Turin, who has done valuable work upon the Dermapterous fauna of the Neotropical and Ethiopian Regions, but as the name is praeoccupied by Rehn (1906, Proc. U. S. N. M., XXX, p. 379), I have suggested a new name *Euborellia*. It contains at present nine* species, which may be arranged as follows:—

1. Elytra libera per marginem suturalem, usque ad apicem contigua, subquadrata; species americanæ.
2. Pedes unicolores, testacei; antenarum segmenta 1 et 2 flava, ceteris flavo-brunneis 1. *ambigua*, Borelli.†
- 2.2. Femora fusco-annulata; antenarum segmenta 1 et 2 rufescentia, ceteris brunneis 2. *janeirensis*, Dohrn.
- 1.1. Elytra haud contigua, lateralia, vel saltem per minimam partem marginis suturalis contigua.
2. Elytra in parte basali angusta, mesonotum in modum scutelli liberantia; in parte postica valde dilatata, ad suturam attingentia, metanotum obtegentia; species ceylonica 3. *greeni*, Burr.
- 2.2. Elytra angustata, lateralia, nequam contigua.
3. Forceps ♂ dentatus; species americanæ
4. Forceps ♂ dente magno armato; segmentum ultimum dorsale ♂ lateribus plicis 2 instructum; colore aterrimo 4. *peruviana*, Borm.
- 4.4. Forceps ♂ dente parvo armatus; segmentum ultimum dorsale lateribus tuberculis 2 instructum 5. *armata*, Borelli.

* *Anisolabis andreinii*, Bor., from Eritrea has rudimentary elytra, and so this species also must be included here, and also *Anisolabis minuta*, Caudell.

† Since writing the above, I have compared syntypes of *E. ambigua*, Borelli, with authentic specimens of *E. janeirensis*, Dohrn, with which I now sink it as a homonym.

- 3.3. Forceps ♂ inermis; species mundi antiqui.
- 4. Forceps ♂ valde asymmetricus; species tasmanica 6. *tasmanica*, Borm.
- 4.4. Forceps ♂ regulariter vel fere regulariter arcuatus vel curvatus.
- 5. Femora haud annulata.
- 6. Abdomen laeve; pronotum planum; caput thoraxque fusca; species europaea . 8. *moesta*, Gènè.
- 6.6. Abdomen punctatum; pronotum prozona tumida; caput thoraxque pallescentia; species indica 9. *annandalei*, Burr.

Genus 5.—*PSALIS*, Serv.

This genus only differs from *Anisolabis* and *Euborellia* in having fully developed organs of flight. *Carcinophora*, Scudder, must fall, the only real difference from typical *Psalis* being the abbreviation of the wings alone; as the character is insufficient to justify specific rank, it cannot support a genus.

I now include it in the following sixteen species:—

- 1. Pronotum parallelum; species americanae.
- 2. Elytra abbreviata, scutello saepius patenti; elytra maculata 1. *festiva*, sp. n.
- 2.2. Elytra perfecte explicata.
- 3. Elytra maculata.
- 4. Statura mediocri; (14–18 mm.); elytra ad humeros maculata.
- 5. Corpus glabrum; abdomen segmentis 6–9 lateribus acutis . 2. *percheron*, Guer.
- 5.5. Corpus pilosum; abdomen segmentis 6–9 haud acutis 3. *rosenbergi*, Burr.
- 4.4. Statura majore; (18–25 mm.) Elytra disco maculata . . . 4. *americana*, Beauv
- 3.3. Elytra unicoloria.
- 4. Caput longum 5. *fusca*, Borelli.
- 4.4. Caput brevius.

- 5. Antennae segmentis 4-5-6 longis; pronotum longius quam latius 6. *gagatina*, Klug.
- 5.5. Antennae segmentis 4-5-6 globularibus; pronotum aequè longum ac latum 7. *nigra*, Caud.
- 1.1. Pronotum postice ampliatus.
- 2. Elytra triangularia; species orientalis 8. *castetsi*, Bol.
- 2.2. Elytra rectangularia.
- 3. Antennae tenues, segmentis apice valde clavatis.
- 4. Alae nullae; species americana 9. *waddyi*, Burr.
- 4.4. Alae perfecte explicatae; species orientalis 10. *femoralis*, Dohrn.
- 3.3. Antennae fortiores, cylindricae vel subcylindricae.
- 4. Antennae segmentis 4-5-6 globularibus, omnibus brevibus 11. *plebeja*, Dohrn.
- 4.4. Antennae segmentis, 4 brevi, 5 et 6 longioribus, ceteris subcylindricis.
- 5. Antennae segmento primo brevi; species americana 12. *burri*, Borelli.
- 5.5. Antennae segmento primo longo.
- 6. Antennae segmento 3 brevi.
- 7. Colore fulvo-castaneo, haud metallico; species americana 13. *scudderi*, Borm.
- 7.7. Colore atro caeruleo-nitenti; species orientalis 14. *dohrni*, Kirby.
- 6. Antennae segmento 3 longo; species africanae.
- 7. Antennae segmento 4 globulari; pronoto brevi, scutello parvo liberanti 15. *debilis*, Burr.
- 7.7. Antennae segmento 4 cylindrico; pronoto super elytra producto 16. *cincticollis*, Gerst.

Psalis festiva, sp. n.

Allied to *P. americana*; differs in the smaller size, more slender build, abortive wings, and strongly abbreviated

elytra. Length of body 18.5–23 mm.; of forceps 3.50 mm.
♀; ♂ unknown.

BRAZIL, Bahia (Mus. Vienna).

This species is represented by three females in the Brunner von Wattenwyl collection, now in the Hofmuseum, Vienna, and will be fully discussed in a forthcoming work on the material of that Museum.

Psalis gagatina, Klug.

I have recently discussed the identity of this species (1909⁶, p. 126). I consider that *Carcinophora robusta*, Scudder, with its synonymous *Psalis columbiana*, Borm., is the real *P. gagatina* of Klug.

Psalis nigra, of Caudell, from Trinidad, is only known from the female; the almost square pronotum and short, thick antennal segments appear to be characteristic features.

Psalis cincticollis, Gerst., is discussed elsewhere in a recent paper (1909⁶, p. 113). *Psalis picina*, Kirby, falls as a synonym.

Psalis thoracica, Serv., I believe to be referable to the *Pyragrinae* (q.v., ante, p. 167).

Sub-family 7.—LABIDURINAE.

The group includes *Labidura*, and its immediate allies; in structure it agrees in many respects with the *Psalidinae*, but the mesonotum is less rounded posteriorly. The organs of flight are all well developed; the antennae are multisegmentate; the forceps rather slender and usually remote at the base.

TABLE OF GENERA.

- 1. Pedes breves; femora postica pronotum haud longiora; tarsorum posteriorum segmentis 1 et 3 subaeque longis, pronoto unitis haud longioribus (pronotum postice ampliatum) 1. *Paralabidura*, n. g.
- 1.1. Pedes longi; femora tarsi postici pronoto longiores; tarsorum posteriorum segmentum primum tertio longius.

- 2. Pronotum postice ampliatus, longius quam latius; scutello nullo; femora postica pronoto circa 1½ longiora.
- 3. Abdomen lateribus integris . . . 2. *Labidura*, Leach.
- 3.3. Abdomen lateribus spinulis vel plicis constatis armatum . . . 3. *Forcipula*, Bol.
- 2.2. Pronotum quadratum; scutello magno; femora postica pronoto triplo longiora 4. *Tomopygia*, Burr.

Genus 1.—PARALABIDURA, n. g.

Cum genere *Labidura* congruet; differt statura minore et graciliori, tarsis brevioribus, posticis pronotum longitudine haud vel vix superantibus, segmentis primo et tertio subaequantibus.

Differs only from *Labidura* in the smaller size and slender build, and shorter tarsi, the posterior pair scarcely, or not at all, exceeding the pronotum in length, the first and third segments approximately equally long, and the third segment slightly exceeding the first.

This genus is raised for the reception of the small, dark slender species, hitherto included in *Labidura*.

In all known species the colour is dark chestnut.

The posterior tarsi are of different lengths in the different species, but in no case does the posterior pair exceed the length of the pronotum, and first, second and third segments are either equal, or the third a little longer than the first; in *Labidura* and *Forcipula* the first segment is the longest.

The type of the genus is *Paralabidura lividipes*, Duf.

TABLE OF SPECIES.

- 1. Forcipis brachia ♂ margine interno haud laminato 1. *lividipes*, Dufour.
- 2. Tarsi postici pronoto breviores; forceps ♂ arcuatus, haud depressus.
- 2.2. Tarsi postici quam pronotum aequè longi; forceps ♂ elongatus, depressus 2. *tenuicornis*, Borm.
- 1.1. Forcipis brachia ♂ margine interno laminato.

2. Forcipsis brachia ♂ parte laminata
 parallela, apice rectangula, species
 indica 3. *nepalensis*, Burr.
 2.2. Forcipsis brachia ♂ parte laminata
 in dentem valde acutum pro-
 ducta, species africana 4. *figinii*, Burr.

Paralabidura lividipes, Duf., is a widely distributed and familiar species; the development and armature of the forceps vary considerably, as would be expected, and consequently there are several synonymous names.

P. tenuicornis, Borm., is a larger, but allied, species from Sumatra.

P. nepalensis, Burr, has laminate forceps; it is only known from Nepal, and is figured in a recent work (Burr, 1910¹, fig. 30).

P. figinii, Burr (1908¹², p. 176), also has laminate forceps: it is based on a pair from Eritrea, in the Genoa Museum. It is interesting to note that it has a strong resemblance to some undescribed species preserved in Baltic amber of Oligocene age.

Genus 2.—LABIDURA, Leach.

This genus now includes only *L. bengalensis*, Dohrn, and the polymorphic *L. riparia*, with its numerous forms, mutations, varieties, races, sub-species, or even species, according to the individual opinion of every author. The synonymy is consequently very involved, and it is difficult to assign the correct name to the various forms. Kirby (1903) has given a useful preliminary arrangement; he separates the apterous Neotropical race into a distinct genus, *Demogorgon*, and is followed by Borelli, but I can hardly agree with either. Personally I cannot allow more than specific rank to these large, pale, apterous forms, and not even that with a feeling of real conviction. I can only say that certain well-marked geographical races stand out, as *pluvialis*, Kirby, from New Guinea; *truncata*, Kirby, from Australia; a small apterous form from India, that I have provisionally identified with "var., *inermis*" of Brunner, and *xanthopus*, Stål, from South America; *bengalensis*, Dohrn, from Bengal, is of no higher rank.

Genus 3.—FORCIPULA, Bol.

This is a well-marked genus, containing several large earwigs, occurring in tropical parts of Asia, Africa and America, having the sides of the abdomen furnished with spines, tubercles or crests in the male, and elongate slender forceps. I offered a revision of the genus in 1904², p. 288, and now suggest the following modified arrangement:—

FORCIPULA. •

- 1.1. Abdomen segmentis nonnullis lateribus cristis obliquis serratis instructis.
 2. Colore nigro, elytris rufis; species americana 1. *americana*, Borm.
 - 2.2. Colore fulvo; species indica 2. *lurida*, Bol.
- 1.1. Abdomen lateribus segmentis nonnullis spinis armatum.
 2. Abdomen lateribus segmentis 3-6 spinis binis armatum; elytra brevia; alae abbreviatae; species indica 3. *decolyi*, Borm.
 - 2.2. Abdomen segmentis nonnullis spinis singulis armatum.
 3. Elytra costa carinula nulla; species indicae.
 4. Statura majore 35-43 mm. (alae longae; abdomen spinis 4 armatum) 4. *pugnax*, Kirby.
 - 4.4. Statura minore (16-20 mm., alae breves; abdomen spinis 2 vel 3) 4a. *var. minor*, Burr.
- 3.3. Elytra costa carinula instructa.
 4. Elytrorum carinula debili, fere laevia.
 5. Segmentum ultimum dorsale inerme; forceps constrictus; abdomen spinis 3; colore fusco; species indica 5. *trispinosa*, Dohrn.

- 5.5. Segmentum ultimum dorsale utrinque tuberculo erecto magno armatum; forceps sinuatus; colore fulvo; species africana . . . 6. *congo*, Burr.
- 4.4. Elytra granulosa, carinula fortiori.
5. Forceps constrictus; species orientales.
6. Forceps ad angulum dentatus 7. *tarsata*, Westw.
- 6.6. Forceps ad angulum inermis 8. *quadrispinosa*, Dohrn.
- 5.5. Forceps sinuatus.
6. Abdomen spinulis 3; pygidium trispinulosum; forceps unidentatus; species americana . . . 9. *quelchi*, Burr.
- 6 6. Abdomen spinulis 4; abdomen inerme.
7. Statura majore (34-38 mm.); forceps unidentatus; species africana 10. *gariazzi*, Bor.
- 7.7. Statura minore (21-22 mm.); forceps basi denticulatus; species orientales.
8. Forceps rectus; abdomen granulosum, spinulis recurvis . . . 11. *jacobsoni*, Burr.
- 8.8. Forceps undulatus; abdomen punctulatum; spinulis rectis 12. *walkeri*, Kirby.

Genus 4.—TOMOPYGIA, Burr.

This genus was erected by me in 1904, p. 287, for the curious creature from Java described by de Bormans under the name *Cylindrogaster abnormis*. It is undoubtedly allied to *Labidura* and *Paralabidura*, but the abbreviated elytra, broad short scutellum, small, square pronotum and exceedingly long and slender legs, are all strong characters.

Sub-family 8.—*PARISOLABINAE*.

This group was formed by Verhoeff for a district New Zealand species which he described under the name *Parisolabis novae zeelandiae* (1904, p. 120). I have recently added the genus *Pseudisolabis* (1908⁹, p. 254) for *P. walkeri*, also from New Zealand. Later still, I have raised the group to the rank of sub-family (1910¹, p. 102). The genus *Pseudisolabis* now contains also *P. burri*, Borelli, and *P. tenera*, Burr, both Indian species.

Sub-family 9.—*BRACHYLABINAE*.

This interesting group was separated by de Bormans from *Anisolabis*, with which it had been unnaturally arranged previously, but it has been little known until recently.

The group is interesting on account of several apparently primitive features. In a number of genera we find that the eyes are not spherical, as in most earwigs, but ovate or elliptical, and very large, extending from the insertion of the antennae backwards almost to the hinder margin of the head; at the same time, the head itself is not pentagonal, but almost triangular, so that in these particular genera the eyes may be said to be truly lateral.

That this large size and lateral position of the eyes is a primitive feature is indicated by the discovery of a number of fossil earwigs in the famous Tertiary Lake Basin of Florissant, in Colorado, from which Scudder described and figured no less than eleven species.

These all show an approach to a primitive type in the uniformity of character, simplicity of structure, and general similarity, but the most remarkable feature is the great size and lateral position of the eyes. This is best seen in his figs. 2 and 3 (*L. avia*), fig. 12 (*L. exsulatum*). (Scudder 1890, Tert. Ins., Pl. XVI.)

So much was Scudder impressed by this feature that he erected a species genus, *Labiduroomma*, for their reception.

There are other features, too, in the *Brachylabinae* that appear to be primitive; for instance, the forceps are invariably simple; they are, in fact, the simplest imaginable type of forceps, the branches being cylindrical, that is circular in cross section, absolutely unarmed, tapering and

very gently arcuate. The only sexual difference in the forceps is that in the female the branches are somewhat closer together at the base than in the male.

The pauci-segmentate antennae may perhaps be looked upon as another primitive feature, as also the spindle-shaped body. In many or all of the species there is a pair of curved impressions on the frons between the eyes; can these be vestiges of ocelli? These organs are unknown in earwigs.

The total absence of organs of flight is probably to be explained rather by degeneration than by non-development, since one African form, *Arlex sjoestelti*, Borg., possesses signs of rudimentary elytra on the mesonotum analagous to the same rudiments in *Karschiella*, which is, moreover, also a primitive type, its larva probably having segmented caudal setae instead of forceps, as in its near ally *Bormansia*, and the not distantly related *Diplatys*.

The legs in the *Brachylabinae* are very simple, and show neither keels on the femora nor specialisation in the segments of the tarsi. The second segment is decidedly longer than in most other earwigs. I can detect no trace of pulvillus between the claws, nor are the claws different from those of other earwigs. The *Brachylabinae* all have a strong family likeness and cannot be confused with any other group.

Apart from the various features enumerated above, the last dorsal segment has the posterior margin emarginate or concave, and the two lobes are pointed and slightly produced over the forceps. All known species are deep dull black in colour, and probably are clothed in life with a long velvety pubescence, which is generally worn off in cabinet specimens.

They appear to be rare insects, but are widely distributed throughout the tropical regions, occurring in Java, Burmah, India, Ceylon, Madagascar, Africa, Guatemala, Brazil, Peru, etc. This wide distribution of so well-marked a type of earwig is probably also an archaic feature.

Verhoeff was the first to draw attention to the great size of the eyes in certain *Brachylabinae*; in his paper on "Neue ungefluegelte Eudermapteren-Gattungen" (SB. Ges. Naturfr. Fr. 1901, p. 10) he makes a special point of this feature in distinguishing his family *Isolabidae*. The words he uses are: "Augen sehr gross, hoechstens um $\frac{2}{3}$ ihres Durchmesser von Hinterhaute entfernt."

In a recent paper I revised the *Brachylabinae* (Ann. Mag. N. H. (8) vol. ii, pp. 246-355, 1908), showing that Verhoeff's *Isolabidae* coincide with the already known *Brachylabinae*.

In that paper I sunk *Ctenisolabis*, Verhoeff, in *Brachylabis*, Dohrn, not because I considered *C. togoensis* (type of *Ctenisolabis*) congeneric with *B. chilensis* (type of *Brachylabis*), but because Verhoeff's diagnosis of *Ctenisolabis* gives no character not common to *Brachylabis*.

But the consideration of the eyes, suggested by the study of fossil forms, suggests a modification of this arrangement, because *B. chilensis*, the type of *Brachylabis*, has eyes which are large, it is true, but do not reach back near to the posterior margin of the head, being more normally situated.

Most of other species of *Brachylabinae* known to me have lateral eyes, and this appears to be the case in *Ctenisolabis togoensis*, Verh., judging from a sketch of the type made for me by Herr Flandetsky in the Berlin Museum.

It would accordingly appear necessary to confine *Brachylabis* to its type, *B. chilensis*, and to revive *Ctenisolabis* with its type, *C. togoensis*, Verh., and also for some of the other species formerly included by me in *Brachylabis*, separating others into a new genus which stands in exactly the same relation to *Isolabis* that *Ctenisolabis* stands to *Leptisolabis*.

This modification of my former views, suggested by an examination of further material, was first put forward in a recent work on the Earwigs of India, the faunistic scope of which, however, prevented the treatment of the whole group.

I accordingly now offer a revised system, with sundry observations, upon all forms known to-day.

TABLE OF GENERA.

1. Oculi parvi, anteriores.
 2. Elytra rudimentaria adsunt . . . 1. *Arlex*, n. n.
 - 2.2. Elytra omnino desunt.
 3. Mesonotum carinatum . . . 2. *Brachylabis*, Dohrn.
 - 3.3. Mesonotum haud carinatum . 3. *Nannisolabis*, Burr.
- 1.1. Oculi magni, laterales.
 2. Antennarum segmentum 3 elongatum, duplo longius quam latius; 4 sat longum haud globulare.

3. Mesonotum haud carinatum . . . 4. *Isolabis*, Verh.
 3.3. Mesonotum carinatum . . . 5. *Metisolabis*, Burr.
 2.2. Antennarum segmenta brevia,
 3 haud vel vix longiori quam
 latiori, 4 globulari.
 3. Mesonotum carinatum . . . 6. *Ctenisolabis*, Verh.
 3.3. Mesonotum haud carinatum . 7. *Leptisolabis*, Verh.

SCHEME OF GENERA OF THE BRACHYLABINAE.

A.

Rudimentary Elytra present . . . *Arlex*, n. n.

B.

No rudiments of Elytra.

Mesonotum.

		Keeled	Smooth
Eyes small.		<i>Brachylabis</i>	<i>Nannisolabis</i>
Eyes big.	3rd and 4th antennal segments long.	<i>Metisolabis</i>	<i>Isolabis</i>
	3rd and 4th antennal segments short.	<i>Ctenisolabis</i>	<i>Leptisolabis</i>

Genus 1.—ARLEX, n. n.

Verhoeffia, Burr, 1908⁹, p. 248.

This is the only member of the family showing any trace of rudiments of elytra. This feature is well shown in Borg's figure (1904, p. 568, Taf. XXVI, fig. 2), as also the normal situation of the eyes.

The genus is monotypic for *Brachylabis sjöstedti*, Borg. (*l. c.*), from the Cameroons.

The name *Verhoeffia* is praeoccupied by Broleman in *Myriapoda* in 1895, so I proposed the new name *Arlex*.

Genus 2.—BRACHYLABIS, Dohrn.

Brachylabis, Dohrn (partim) (1884), p. 297.

„ Borm. (1883), p. 64.

„ Burr (1908⁹), p. 248.

The type of this genus is *Brachylabis chilensis*, Blanchard, from Chile.

It is very unfortunate that the true Chilian *B. chilensis* is not better known; it is not represented in any collection that I have examined, and I have not been able to find the types in the Paris Museum, where, however, Dohrn found them and redescribed them.

Now Dohrn's description is important, for it gives several features which preclude that species which is generally labelled *B. chilensis* in collections, but comes from Brazil, and not from Chile.

It is a pity that Dohrn does not refer to the size, nor form of the eyes, nor to the presence or absence of a keel on the mesonotum.* These are, of course, essential features, and as *B. chilensis* is the type-species of the group, it is most desirable that the doubt be removed as soon as possible.

The Brazilian species commonly known as *B. chilensis*, being distinct therefrom, requires a new name, for which I propose *coriacea*, as some specimens are thus named in MS. in the Brunner collection.

The points in which *B. coriacea*, sp. n., differs from *B. chilensis*, according to Dohrn's description, are as follows:—

<i>B. chilensis</i> , Blanch.	<i>B. coriacea</i> , sp. n.
(From Chile; based on Dohrn's description.)	(From Brazil.)
Pronotum so breit als lang.	Pronotum about $1\frac{1}{2}$ times longer than broad.
Pronotum in der Mitte quer geteilt durch eine Sattelfoermige Vertiefung.	Pronotum not so divided; no transverse sulcus.
Das 2te und 3te Segment des Abdomens mit deutlicher Falte.	Tubercles feeble.
. . . die folgenden Segmente beim ♂ an der Seite winklig, nach hinten in eine stumpfe Spitze ausgezogen.	Sides of these segments in the ♂ rounded.

* Blanchard's description and figure are equally silent on these essential points; his figure is very sketchy, and probably untrustworthy; it gives small eyes and smooth mesonotum, but we must not attach too much importance to it.

The above discrepancies are to my mind quite decisive, and I have no doubt that the Brazilian *B. coriacea* is quite distinct from *B. chilensis*. But as it is generally known under that name in collections, it is convenient to define the typical genus *Brachylabis* by the main generic features of *B. coriacea*, as I have done in the preceding table, *i. e.* eyes small and normal, and mesonotum keeled; the antennae segments are cylindrical, not globular, the fourth being a little shorter than the third.

It is quite possible, or even probable, that when the true *B. chilensis* is re-examined, it will be found to be generically different from *B. coriacea*. It will then be necessary to re-characterize the genus, and to erect a new one for *B. coriacea*.

B. coriacea has all the characteristics of the group in colour, appearance, texture and general structure; the antennae have 15-16 segments, and are paler at the apex; the pronotum is about $1\frac{1}{2}$ times as long as broad, gently widened posteriorly; the mesonotum has a distinct keel running its entire length; the legs are yellowish brown; the forceps of the male are arcuate towards the tips, and sometimes have a blunt tooth near the base.

I possess specimens from Espirito Santo, and in the Brunner collection there are specimens from Santa Catherina and Novo Friburgo.

I may add that these are not common insects, and it is not probable that any one species should be common to Brazil and to Chile.

Brachylabis scotti, sp. n.

Statura minore, robustiori; oculi parvi, anteriores; antennae segmentis 10 elongatis, conicis; mesonotum laud carinatum; abdomen dilatatum; forceps paullo arcuatus. ♂

Long. corporis 6 mm.
 „ forcipis 1.5 „

Hab. Seychelles.

I describe this species here briefly; it will be more fully discussed in a work upon the *Dermaptera* of the Seychelles, on material obtained by the Gardiner-Scott expedition.

We must provisionally place it in this otherwise Neotropical genus; when more material is discovered, its true relationship will doubtless be better defined.

Perhaps the creature described by Montrousier, 1864, p. 272, under the name of *Chelidura geniculata*, from New Caledonia, is to be referred here. De Bormans' collection contained a specimen, now in the British Museum, from New Caledonia, which is decidedly a Brachylabid. The antennae are missing, and the specimen is a female; but the eyes are normal, and the keels of the mesonotum are very sharp and distinct. The pronotum is a little longer than broad. It is described by de Bormans, 1900², p. 54.

Genus 3.—NANNISOLABIS, Burr.

Nannisolabis, Burr, 1910¹, p. 106.

I erected this genus for two Cingalese species which have normal, small, anterior eyes and globular antennal segments. The mesonotum has in its anterior portion a transverse depression which is bounded by a raised tumid ridge. Though somewhat compressed at the shoulders, this ridge is not sharp.*

In the globular antennal segments and non-keeled mesonotum it approaches *Leptisolabis*, but differs in the normal eyes.

The type of the genus is *Nannisolabis willeyi*, Burr, the other species being *N. philetas*, Burr, 1901, p. 322, Pl. VIII, fig. 7. The figure shows the peculiarities referred to.

Unfortunately, of the original pair of this latter species, owing to an accident, all that is left is the head and thorax of the male, but this, with the original description and figure, is enough to allow its position being satisfactorily determined.

I place here also, provisionally, a very distinct new species from Australia.

TABLE OF SPECIES.

- | | |
|--|-----------------------------|
| 1. Pronotum longius quam latius; species orientales. | |
| 2. Pronotum parallelum, punctatum . . . | 1. <i>philetas</i> , Burr. |
| 2.2. Pronotum postice ampliatus, laeve . . | 2. <i>willeyi</i> , Burr. |
| 1.1. Pronotum transversum; species australica | 3. <i>holdansi</i> , sp. n. |

* Perhaps some of these peculiarities are due to immaturity of the specimens.

Nannisolabis holdausi, sp. n.

Statura sat robusta; caput subquadratum: pronotum transversum; mesonotum integrum.

♀

Long. corporis	13 mm.
„ foreipis	2 „

Of rather stout build, for this genus large; colour deep reddish-brown or blackish, scarcely punctate.

Head broad, sutures distinct; occiput rectangular; eyes anterior and relatively small.

Antennae with 16 segments, two or three praeapical segments yellowish; 3rd segment long and cylindrical; 4th ovate, about half as long as the 3rd; the rest gradually lengthening, the apical segments about equalling the 3rd.

Pronotum distinctly broader than long, rectangular.

Mesonotum a little shorter and a little broader than the pronotum, with no keel.

Legs long and slender, typical of the sub-family, yellow, the femora and tibiae banded with black.

Abdomen somewhat dilated about the middle, tapering apically, typical.

Penultimate ventral segment narrowly rounded.

Forceps subcontiguous, rounded, rapidly tapering.

AUSTRALIA: QUEENSLAND, Cooktown (coll. Brunner, No. 20, 162, 1 ♀).

Although this specimen is a female, and no male is known, the characters are so well marked that the species can be easily recognized, apart from the fact that it is the only known Australian member of the sub-family, except the doubtful *B. geniculata*.

I place it in *Nannisolabis* on account of its small eyes and smooth pronotum, but in its broad head and transverse pronotum it differs from the other two known species, as also in the long antennal segments; a new genus must be erected for it when the male is discovered. This new genus will stand in the same relation to *Nannisolabis* that *Leptisolabis* stands to *Isolabis* and *Ctenisolabis* to *Metisolabis*.

The type is in the Brunner collection, now in the Hof-museum in Vienna.

Genus 4.—ISOLABIS, Verhoeff.

Isolabis, Verh., *op. cit.*, p. 14.

Isolabis, Burr (*op. cit.*).

This genus is monotypic for *I. braueri*, Verh., from Africa. It is somewhat larger than its allies.

Genus 5.—METISOLABIS, Burr.

Metisolabis, Burr, 1910¹, p. 108.

Antennae segmentis longis, omnibus longioribus quam latioribus ; mesonotum lateribus carina, interdum obtusa, instructum ; ceteris cum *Ctenisolabide* congruet.

I formed this genus for those species which have the antennal segments elongate, cylindrical, always longer than broad, even the fourth. Thus it approaches *Isolabis*, Verh., to which it stands in the same relation as *Ctenisolabis* to *Leptisolabis*.

The type of the genus is *Brachylabis voeltzkowi*, Burr, from Nossi-bé, though that species has the keels of the mesonotum decidedly blunt and rounded, thus approaching *Isolabis*.

I place *Br. bifoveolata* here because Bolivar figures it with clearly elongate antennal segments and well-marked keels.

TABLE OF SPECIES.

- | | |
|---|------------------------------|
| 1. Pronotum longius quam latius ;
species madecassae. | |
| 2. Mesonotum carinis obtusis, usque
ad marginem posticum productis | 1. <i>malgacha</i> , Burr. |
| 2.2. Mesonotum carinis acutis, ante
marginem posticum evanescentibus | 2. <i>voeltzkowi</i> , Burr. |
| 1. Pronotum vix longius quam latius ;
species orientales. | |
| 2. Pedes unicolores ; abdomen seg-
mento 4 plicifero | 3. <i>bifoveolata</i> , Bol. |
| 2.2. Pedes fulvo-annulati ; abdomen
segmentis 3 et 4 pliciferis | 4. <i>caudelli</i> , Burr. |

Genus 6.—CTENISOLABIS, Verh.

This genus is now restricted to those species with short and almost globular antennal segments and keeled mesonotum, with large, lateral eyes.

The type of the genus is *Ctenisolabis togoensis*, Verh.

TABLE OF SPECIES.

- 1. Carinae mesonoti acutae, usque ad marginem posticum percurrentes.
- 2. Frons punctis impressis postice confluentibus; species africana . . . 1. *togoensis*, Verh.
- 2.2. Frons punctis impressis haud confluentibus; species americanae meridionalis 2. *nigra*, Scudd.
- 1.1. Carinae mesonoti obtusae, antice marginem posticum evanescentes.
- 2. Corpus valde pilosum; species orientalis 3. *fletcheri*, Burr.
- 2.2. Corpus fere glabrum; species americanae.
- 3. Pronotum vix longius quam latius; statura minore (8 mm.), robustiori 4. *montana*, Bor.
- 3.3. Pronotum distincte longius quam latius; stature paullo majore (11.5 mm.), graciliori 5. *fernandezii*, Bor.

Ct. togoensis, Verh., is only known to me from Verhoeff's description and a sketch of the type by Herrn Flandezky of Berlin. It appears to resemble its allies very closely, but is at present the only known African member of the genus.

Ct. nigra, Scudd., appears to be relatively common in Brazil, and extends into Paraguay. It was originally described by Scudder as a *Cylindrogaster*, with which genus, of course, it has no affinities. But in those days this group was exceedingly imperfectly known, and Scudder only had a single female.

Ct. fletcheri, Burr, is the only known Oriental species.

Ct. montana, Bor. (1909³, p. 5), from Costa Rica, closely resembles *Ct. nigra* and *Ct. fletcheri* in appearance. It is

well described, but not figured, by Borelli. It must be carefully distinguished from *Ct. nigra*. The antennal segments are rather longer than the other species, thus affording the transition to *Metisolabis*.

Ct. fernandezi, Ber. (1909³, p. 4, fig. 2), is well described and figured by Borelli. It occurs in Costa Rica. The unique type has white eyes, which are very prominent, but this colour is probably not a permanent feature. The body is longer and build slenderer than in the other species, and the pronotum is much more finely punctulate than in *Ct. montana*.

All the species of *Ctenisolabis* have a strong family likeness, and though when placed side by side they appear to be quite distinct, it is difficult to express the difference in words. As they are apterous, and rare forms, probably each with a restricted distribution, the locality becomes an important specific character.

The occurrence of such similar species in such widely separated localities is probably an archaic feature, pointing to the great age of a group, now dying out, and which must formerly have been a dominant and widely distributed type of earwig.

Perhaps more than one species is confused under the name *Ct. nigra*, but I cannot distinguish between Paraguayan and Brazilian specimens.

Genus 7.—LEPTISOLABIS, Verh.

Leptisolabis, Verh., *op. cit.*, p. 12.

Brachylabis (*partim*), Borm.

This genus is characterised by the lateral eyes, non-keeled mesonotum and globular 4th and 5th antennal segments.

The type is *L. usambarana*, Verh., from Usambara (Africa). It includes also the true *Br. punctata* of Dubrony from Java, which is distinct from the species quoted by him under that name from Burmah, which is *Metisolabis caudelli*, Burr.

One of the chief features of the two African species described by Verhoeff, *L. usambarana* and *L. theoriae*, is that the anterior border of the pronotum is produced into

a narrow neck. This is not the case in *L. punctata*, but is in *L. howardi*, Burr, from Guatemala.

As the two African forms are unknown to me in the flesh, I cannot erect a satisfactory table of species, but it is unlikely that a Central American insect can be confused with African forms.

By good fortune I have been able to examine the original insect quoted by Caudell from Guatemala as *Brachylabis nigra*. Owing to the distance between Guatemala and Para, I was not surprised to find on examination that Caudell's specimen is distinct. It is a true *Leptisolabis*, as will appear from the following description.

Leptisolabis howardi, Burr.

Brachylabis nigra, Caudell, 1907², p. 172.

Leptisolabis howardi, Burr, 1910, Proc. U.S. Nat. Mus., vol. 38, p. 449.

Statura minore, gracili; colore atro, antennis pedibusque pallescentibus; corpus totum confertim punctulatum; oculi magni, marginem posticum capitis fere attingentes; pronotum elongatum et postice ampliatus, margine anteo in collem producto; forecipis brachia ♂ cylindrica, basi haud contigua, sensim arcuata.

	♂	
Long. corporis	8	mm.
„ forecipis	1.75	„

Size small and slender.

Colour jet black, dull. The whole body clothed with long golden pubescence. The whole surface finely and densely punctulate.

Antennae with 13 segments, brownish grey, all the segments very thick, 3rd scarcely longer than broad, 4th really broader than long; 5th globular, the rest gradually lengthening and also thickening.

Head tumid, hinder margin straight, sides convex, and in front triangular. The small marks on the frons indistinct. The punctulations are exceedingly fine.

The eyes are very large and prominent, ovate in shape, and extend from the insertion of the elytra almost in the posterior margin of the head, gently converging posteriorly.

Pronotum about $1\frac{1}{2}$ times as long as the average breadth, all margins straight, sides gently diverging as the pronotum widens somewhat posteriorly. The anterior margin has the middle portion produced slightly, and carried a short but distinct cylindrical neck, so that the head is distinctly separated from the pronotum.

Mesonotum transverse, posterior margin truncate; sides not keeled, but raised with blunt, tumid ridges converging posteriorly.

Metanotum strongly concave posteriorly, almost entirely covering the first abdominal segment.

The whole of the thoracic plates are dull black and densely and finely punctulate.

Prosternum is double as long as wide, parallel.

Mesosternum and metasternum somewhat broader than long, the posterior margin truncate; sternal plates reddish black and densely and finely punctulate.

Legs typical, femora slender, black, yellow at the base and apex, long and slender.

Tibiae long and slender, yellowish.

Tarsi yellowish, long and slender.

The second segment elongate and cylindrical, nearly as long as the third; the first is longer than the second and third combined.

Abdomen typical, of same colour and sculpture as the rest of the body, passing to reddish beneath; lateral tubercles on 3rd and 4th segments faint.

Last dorsal segment very short and transverse, but narrower than the abdomen; posterior margin narrowed, and concave in the middle, leaving a short triangular lobe in each side projecting slightly over the forceps.

Penultimate ventral segment short and broad, very obtusely rounded.

Pygidium short, very narrow and compressed.

Forceps with the branches remote at the base, cylindrical, tapering, straight at first, gently arcuate towards the apex.

GUATEMALA: Provincia de Alta Vera Paz, Trece Aguas, Cacao, April 19 (Leg. Schwarz and Barbar) (in U.S. N. M. *vide* Caudell, *loc. cit.*).

This species has a superficial resemblance to *M. nigra*. It differs however in the generic characters, namely, the non-keeled mesonotum; the 4th-6th antennal segments are much shorter, the pronotum longer, and the neck distinct.

It is more difficult to distinguish from *L. punctata*, Dubr., from Java, but is smaller, slenderer, and the sculpture finer, the antennal segments shorter.

It is not quite so small as *N. philetas*, Burr, from Ceylon, the pronotum is much longer and not parallel, and the mesonotum has no strong transverse depression.

‡ cannot compare it with Verhoeff's two African species,

L. usambarana and *L. theoriae*, as these are only known to me from the description.

As these creatures are totally apterous, it is very probable that the various records of "*Brachylabis nigra*" from such various localities as Peru, Bolivia and Brazil refer to distinct species.

It is dedicated to Dr. L. Howard.

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